REPORT RESUMES

ED 018 548 VT 000 774

TRAINING FOR TOMORROW, THE IAM LOOKS AHEAD.
INTERNATIONAL ASSN. OF MACHINISTS, WASHINGTON,D.C.
PUB DATE DEC 64
EDRS PRICE MF-$0.25 HC-$2.12 51P.

DESCRIPTORS- *FEDERAL LAWS, POPULATION TRENDS, EMPLOYMENT TRENDS, LABOR FORCE, *MANPOWER DEVELOPMENT, MANPOWER UTILIZATION, ACADEMIC ACHIEVEMENT, *APPRENTICESHIPS, *JOB TRAINING, *TECHNOLOGICAL ADVANCEMENT, UNITED STATES, CANADA,

INTERRELATED AREAS OF MANPOWER UTILIZATION AS APPRENTICESHIP, TRAINING, AND RETRAINING ARE DISCUSSED AGAINST A BACKGROUND OF THE MAJOR TRENDS AFFECTING MANPOWER DEVELOPMENT IN BOTH THE UNITED STATES AND CANADA. SEVERAL MAJOR FACTORS HAVE AFFECTED MANPOWER UTILIZATION--(1) AN INCREASED POPULATION, (2) AN OLDER POPULATION, (3) MORE WOMEN IN THE LABOR FORCE, (4) TRENDS TOWARD WHITE COLLAR OCCUPATIONS AND SERVICE-PRODUCING INDUSTRIES, (5) GEOGRAPHIC CHANGES RELATED TO SHIFTING DEFENSE REQUIREMENTS, (6) INCREASING UNEMPLOYMENT AFFECTING ESPECIALLY THE UNEDUCATED, THE UNSKILLED, AND THE NEGRO, AND (7) RUSSIAN ACHIEVEMENTS IN SPACE TECHNOLOGY. IN THE POST-WAR PERIOD, CANADA HAS PARALLELED THE UNITED STATES WITH RESPECT TO THE PROBLEM OF MANPOWER ADJUSTMENTS BROUGHT ON BY TECHNOLOGICAL DEVELOPMENTS. EXPECTED OCCUPATIONAL DEVELOPMENTS, INCLUDING AUTOMATION, WILL CAUSE AN INCREASED DEMAND FOR SKILLED WORKERS, AND, CONSEQUENTLY, AN INCREASED DEMAND FOR TRAINING AND RETRAINING PROGRAMS. THE INTERNATIONAL ASSOCIATION OF MACHINISTS (IAM) BELIEVES THAT A FORMAL APPRENTICESHIP PROGRAM IS THE BEST MEANS OF OBTAINING A LEVEL OF COMPETENCE COMMENSURATE WITH THE TITLE OF JOURNEYMAN, HAS EXAMINED ITS PROGRAMS AND POLICIES, AND HAS TAKEN STEPS TO STRENGTHEN AND EXPAND ITS APPRENTICESHIP PROGRAM. IT IS RECOMMENDED THAT IAM REPRESENTATIVES TAKE ADVANTAGE OF FEDERAL PROGRAMS OF TRAINING AND RETRAINING ACTIVATED BY THE--AREA REDEVELOPMENT ACT, MANPOWER DEVELOPMENT AND TRAINING ACT, TRADE EXPANSION ACT, VOCATIONAL EDUCATION ACT OF 1963, AND THE CANADIAN TECHNICAL AND VOCATIONAL ASSISTANCE ACT OF 1960. DETAILS OF EACH LAW ARE INCLUDED. DATA ARE GIVEN RELATIVE TO THE RECESSIONS OF 1948, 1953, 1957, AND 1960, AND TO VARIOUS EMPLOYMENT RELATIONSHIPS. (BS)

ED018548

TRAINING FOR TOMORROW

THE IAM LOOKS AHEAD

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

TRAINING FOR TOMORROW

THE IAM LOOKS AHEAD

prepared by
RESEARCH DEPARTMENT
International Association of Machinists
December, 1964

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY International Association of Machinists
TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE U.S. OFFICE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

Copyright 1964, The International Association of Machinists

FOREWORD

"In his 1964 Manpower Report to the Congress, President Lyndon B. Johnson recently said: 'To make the Nation's manpower more adaptable and productive, and to overcome skill shortages which impede growth, we must encourage and expand

- apprenticeship programs to provide the needed supply of proficient, highly-skilled craftsmen,
- training programs for the employed, to improve existing skills and develop needed new ones, and
- training or retraining for the unemployed, to equip them for employment.'

The International Association of Machinists has historically played a very active manpower role in initiating apprenticeship and related training programs. Because of the changes which are occurring in our economy, there is a need to accelerate our efforts in establishing apprenticeship and comprehensive journeyman training programs in order to prevent further fragmentation of the craft and to provide an adequate supply of our Nation's skilled workers. Experience has shown that the highly-skilled and well-trained worker will best be able to cope with changing job requirements brought about by automation, and further—will be in the most favored position in securing and retaining a gainful employment. We must not only establish more comprehensive programs, but we must also instill within our membership a desire to learn. It must be remembered that a man too old to learn was *always* too old to learn."

A. J. Hayes
International President

TABLE OF CONTENTS

1. Introduction 6

2. Post-War Manpower Developments in the U. S. 7
    1. Population-Labor Force Changes 7
    2. Occupation Shifts 8
    3. Industry Patterns 9
    4. Geographic Changes at Related to Shifting Defense Requirements 9
    5. Post-War Trends in Unemployment 10
    6. Russian Achievements in Space Technology 10
    7. Non-Whites in the Labor Force 10

3. Canadian Manpower Developments in the Post-War Period ... 11

4. Expected Industry and Occupational Employment Trends in the United States: 1960-1975 13

5. The Rising Educational Level of the Labor Force 15

6. Productivity Trends During the Post-War Period 16

7. Automation: Its Origin and Implications 16

8. Automation and Skilled Trades in the IAM 17

9. Changes in Technology and the Need for Training 19

10. Apprenticeship, Training and Retraining—The Experience of Other Craft Unions 20

11. Recent IAM Programs in the Fields of Apprenticeship and Training 21

12. The Need for Apprenticeship and Training Programs in the IAM 23

13. Recent Legislative Acts in the Fields of Training and Retraining 25
    1. Area Redevelopment Act 25
    2. Manpower Development and Training Act of 1962 ... 27
    3. Trade Expansion Act of 1962 31
    4. Vocational Education Act of 1963 32
    5. Canadian Legislation 32

14. Summary 35

15. Technical Appendix and Statistical Tables 36

INTRODUCTION

Since the end of the Second World War, substantial changes in the American economy have affected virtually all phases of manpower utilization and training. Advances in technology, the rapid introduction of automated equipment, changing job requirements, and relatively high levels of unemployment in the face of general prosperity in the economy, have all had a direct bearing on our Organization.

✓ The purpose of this study is to discuss several inter-related areas of manpower utilization—apprenticeship, training, and retraining. These will be presented against a background which describes some of the major post-war trends affecting manpower development in both the United States and Canada. An examination of these areas, within the framework of current and projected manpower needs and requirements, may contribute to a more cohesive and definitive IAM Manpower Policy. It is virtually impossible to discuss all the varied issues and problems related to manpower because of the complexities involved.

This study also includes a brief discussion of recent Federal legislation in the United States and Canada relating to the areas of apprenticeship, training, retraining, and vocational education. We hope that the IAM members will take increasing advantage of these legislative acts as a means of both updating and upgrading their skill levels, emphasizing the need to expand and improve IAM apprenticeship programs in order to prevent a dilution of the craft, as well as meet future manpower needs.

POST-WAR MANPOWER DEVELOPMENTS IN THE UNITED STATES

Since the end of the Second World War, the United States has experienced four relatively brief periods of general economic contraction. On the average, these recessionary periods have lasted approximately one year. The fact that we have not experienced a really prolonged depression for the past two decades is unique when we compare this to earlier economic history. This can largely be attributed to a major shift in our basic economic philosophy, as exemplified by the Employment Act of 1946.

The Federal Government, regardless of administration, is legislatively committed to maintaining maximum employment (or alternatively to minimize unemployment), maximum production, and a relatively stable price level. This commitment was clearly the result of our pre-war experience and the expectation of a massive post-war depression due to cutbacks in military production. At that time the scar of the Great Depression of the 1930's was still a recent memory.

Over the course of time, The Employment Act of 1946 has become a second constitution—an "economic constitution". The psychological support that is derived by this formal declaration of policy cannot be precisely measured. Nevertheless, it has clearly had a major impact on business activity and manpower utilization during the post-war period.

Let us now briefly examine several of the major factors which have affected manpower utilization:

1.1. POPULATION-LABOR FORCE CHANGES Several significant demographic changes have taken place since the end of the Second World War. During the decade of the 1950's, the total U.S. population increased by thirty million persons. At the same time Canada recorded a twenty-eight percent (28%) increase —from fourteen to eighteen million persons. This population explosion reflected a trend towards early marriages and a sharp increase in the birth rate which began in the immediate post-war period.

This impact is just being felt in the labor market. In addition, there has been a substantial increase in the older population as a result of longer life expectancy.

These two factors are clearly shown in the following tabulation:

TRENDS IN POPULATION—YOUNGER AND OLDER PERSONS

Year	Total Population (In millions)	Under 10 years No. (In millions)	Under 10 years Percent of total	65 years and over No. (In millions)	65 years and over Percent of total
1910	92.0	20.4	22.2	3.9	4.3
1940	131.7	21.2	16.1	9.0	6.9
1950	150.7	29.4	19.5	12.3	8.1
1960[1]	179.3	39.0	21.8	16.6	9.2
1970[2] (Projected)	208.9	42.1	20.2	20.0	9.6

[1] Includes Alaska and Hawaii (totaling 860,000 in 1960)

[2] See *Special Labor Force Report No. 24*, "Interim Revised Projections of U.S. Labor Force, 1965-75", Bureau of Labor Statistics

Source: *U.S. Department of Commerce*

One of the most striking post-war labor force changes has been the tremendous number of women who have entered into the labor force. Their rate of labor force participation has risen sharply in the post-war period. On the other hand, due to increased schooling and earlier retirement, labor force participation rates for young people and older workers over sixty-five years of age have both shown relatively sharp declines during the post-war period.

A clearer understanding of the implications of these changes is apparent when one looks at projections of expected labor force growth through 1975. Some thirteen million additional workers are expected to be added to the Nation's work force during the 1960's alone. As shown on Table D of the Technical Appendix found at the end of this study, young workers (under twenty-five) are expected to account for nearly half the increase. In addition, a twenty-five percent expansion in the number of older workers (over forty-five years of age) is expected. We should also point out that due to the low birth rates in the Depression Years, there will be an actual decline in the number of workers in the productive 35-44 age category. It is this latter age group which has historically provided a large portion of our experienced skilled work force.

2. OCCUPATION SHIFTS For the past fifty years, we have experienced a long-run growth trend among white-collar occupations. This trend continued during the post-World War II period. By 1956, white-collar employment, for the first time, outnumbered blue-collar workers. In 1910, white-collar workers accounted for twenty-two percent of total employment. This proportion rose to thirty-seven percent by 1950 and forty-three percent by 1960. Moreover, the changing composition of the labor force (from blue to white-collar workers) was also reported in Canada during this period. White-collar employees numbered approximately four out of every ten Canadian workers in 1960. On the other hand, farm employment has steadily fallen during the past fifty years, representing only eight percent of total employment in 1960 compared with thirty-one percent in 1910. It is expected that by 1970, white-collar workers should number thirty-seven million and account for nearly fifty percent of non-farm employment—with the largest relative gains expected among professional and technical workers. However, we should note that there has been some evidence in recent years of a slow-down in white-collar employment. This may be due to the early impact of automation on the office worker.

Long-Term Occupational Shifts in the American Labor Force
(Percent Distribution)

	1910	1950	1960
ALL WORKERS	100%	100%	100%
White Collar	22	37	43
Professional and technical	5	9	11
Proprietary and managerial	7	9	11
Clerical and Sales	10	19	21
Blue Collar	37	41	36
Skilled	12	14	13
Semiskilled	14	21	18
Unskilled	11	6	5
Service	10	10	13
Farm	31	12	8

3. INDUSTRY PATTERNS

A shift from goods-producing to service-producing industries has been paced by job gains in service, government, and trade. The long-term decline in agriculture and mining continued throughout the post-war period. Since the end of the Second World War, transportation employment has fallen as declines in railroading have more than offset gains in airlines and trucking. Manufacturing still represents about one-third of non-farm employment with pick-ups in durable goods manufacturing and offsetting cutbacks in soft goods manufacturing.

4. GEOGRAPHIC CHANGES AS RELATED TO SHIFTING DEFENSE REQUIREMENTS

There have been some pronounced shifts in defense procurement by Region. For example during the Korean War, Michigan accounted for ten percent of the total. In recent years, its proportion dropped to less than three percent. Between 1953 and 1961, California's share of defense procurement increased from fourteen to twenty-four percent. In addition, five Rocky Mountain States—Arizona, New Mexico, Nevada, Colorado, and Utah, as well as the State of Florida, all increased their share of total defense procurement.

In terms of total non-farm employment (both defense and non-defense related) only three states reported declines between 1947 and 1960. They were West Virginia, Pennsylvania, and Rhode Island. Shifts in industry employment, during the post-war period, were well above the national average (of twenty-one percent) among both Southern and Southwestern States.

5. POST-WAR TRENDS IN UNEMPLOYMENT

There has been a persistent creep upward of unemployment during the post-war period. Since the end of the Second World War, we have experienced four recessionary periods. (See Technical Appendix and accompanying tables at the end).

Following recovery from the 1954 recession, unemployment dropped below the four percent level. After the 1958 recession, unemployment remained around above the five percent mark. Since the end of the most recent business down-turn (1961), unemployment has hovered within a narrow range of five and one-half percent of the civilian labor force, and only recently (mid-1964) has it been closer to the five percent range. Unemployment in the 1962 and 1963 recovery periods—found unemployment averaging as much as in 1954—a recession year. Unemployment, today, although at a seven year low still remains intolerably high for a period of unprecedented general economic prosperity.

During the post-war period, unemployment has fallen heaviest upon the unskilled, the uneducated, the Negro, the older worker and the young job seeker. The factory worker in durable-goods manufacturing, mine workers, and workers in the transportation industry have consistently had unemployment rates which are higher than the national average. Workers least-vulnerable to unemployment are those workers who possess the highest skills, best training, and most education. In addition, throughout the post-war period, we can see a pattern developing whereby the average duration of unemployment has lengthened (i.e., once an individual loses a job, he tends to remain unemployed longer). This is illustrated by the data on Table C.

6. RUSSIAN ACHIEVEMENTS IN SPACE TECHNOLOGY

Although, we cannot quantitatively measure its impact, the Russian success in placing the first satellite in orbit in 1957 (Sputnik) clearly affected our concern about the adequacy of our educational system. It has led us to re-evaluate our educational system in terms of meeting manpower needs as a matter of national security.

7. NON-WHITES IN THE LABOR FORCE

Throughout the post-war period, unemployment has consistently fallen most heavily on the non-white worker. During the past six years, the unemployment rate for non-white workers has been double the jobless rate of white workers. Differences in unemployment rates can partially be explained by the fact that non-whites tend to be concentrated among the lowest occupational skill groupings. Many Negroes are currently operating at skill levels well below their potential capacity. It is expected that the recently enacted Civil Rights Bill of 1964 will have a long-run salutary effect on the employment status of minority groups in the United States.

CANADIAN MANPOWER DEVELOPMENTS IN THE POST-WAR PERIOD

Throughout the post-war period, Canada has paralleled the United States with respect to the problem of manpower adjustments brought on by technological developments. From the late 1950's through the early 1960's, all indications pointed to the persistence of high levels of unemployment in Canada. In fact, a study made by the Bureau of Labor Statistics revealed that in 1960 Canada had the highest unemployment rate of any country in Western Europe, the United States, or Japan. This was true even after making adjustments for differences in the concept and method of measuring unemployment in these countries. It is noteworthy that this period of stagnation appears to have been broken since 1960. Substantial increases in Canada's Gross National Product has sharply reduced unemployment. Annual average jobless rates which were in excess of seven and one-half percent of the labour force (rates during the winter months were actually closer to eleven or twelve percent) were reduced to 5.9 percent of the work force in 1962, and 5.5 percent in 1963. By March, 1964, the seasonally adjusted unemployment rate in Canada had declined to 4.6 percent, its lowest level in seven years. Nevertheless, the fact remains that joblessness in Canada (as in the United States) is still intolerably high in an era of general economic prosperity.

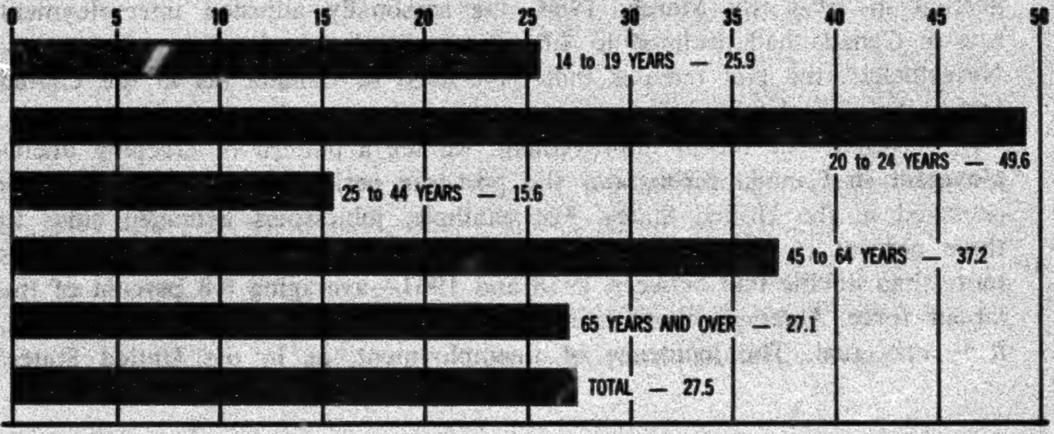
Despite the recent improvement, we see a pattern of creeping unemployment in Canada throughout the post-war period similar to that which occurred in the United States. For example, joblessness averaged close to three percent of the civilian labour force in the 1950-53 period, but was more than double that between 1958 and 1961—averaging 6.8 percent of the labour force. Unemployment is more than a statistical problem in Canada, it is very real. The incidence of unemployment, as in the United States, falls unevenly in Canada. It primarily affects the uneducated, the very young, the aged and varies widely by province.

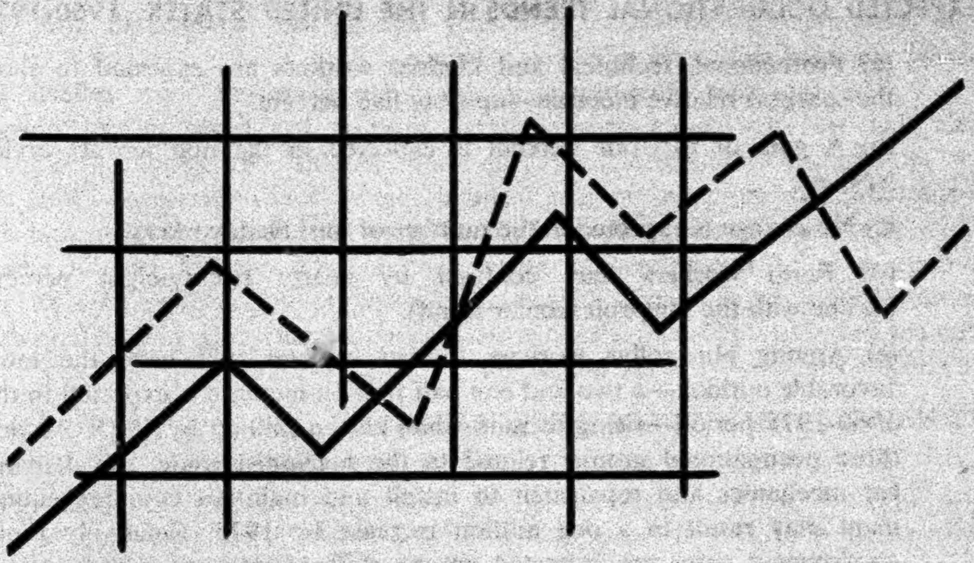
The fact that unemployment has fallen in recent years reflects the fact that real per capita gross national product has again moved upward by approximately ten percent (taking into account the affect of the rise attributable to increases in the general price level.) Between 1949 and 1956, Canada's Gross National Product grew by twenty percent and the average rate of unemployment never exceeded 4.6 percent of the labour force. On the other hand, joblessness climbed to an average rate of 6.4 percent between 1957 and 1961, at a time when real gross national product of Canada remained virtually unchanged.

CANADIAN LABOR FORCE DEVELOPMENTS

In the decade of the 1950's, the Canadian labour force grew by one and one-half million people or nearly twenty-five percent compared with only thirteen percent increase in the United States labor force during this same period. (See table O). Much of the Canadian labour force growth can be attributed to heavy immigration. More than one and one-half million new immigrants arrived in the ten-year span (See table N) and a very large portion of these immigrants entered the labour force during the decade. Federal Department of Labour studies show that immigrants provided one-third of the manpower requirements in many of the skilled trades. However, the persistence of high levels of unemployment in Canada in the late 1950's and early 1960's plus the return of prosperity to many Western Europe countries has made immigration to Canada by skilled European craftsmen less appealing. This is evidenced by a recent Report of the Select Committee on Manpower Training, Ontario Legislature (February, 1963) which stated "... many immigrants—especially in recent years—have arrived here with little education and training." This report further stated that "... because immigration can no longer be counted on to supply us with the steady flow of skilled talent we require, we must either develop these talents internally or suffer serious skill shortages which are bound to slow down our rate of economic growth."

Projected Changes in Canadian Labour Force by Age, 1961 to 1971
Percent Change





EXPECTED INDUSTRY AND OCCUPATIONAL EMPLOYMENT TRENDS IN THE UNITED STATES: 1960-1975

Non-farm wage and salary employment is expected to increase by thirty-seven percent between 1960 and 1975. Service-producing industries which are expected to show a faster-than-average increase are:

(a) The service industry, including laundries, hotels, restaurants, and hospitals, which is expected to grow by sixty-one percent.

(b) Government is expected to grow by fifty-one percent—primarily as a result of an expansion in the educational system at the state and local level. Little change is expected in the Federal Government employment during this period.

(c) Trade and the finance-insurance-real estate industries, which are expected to grow by forty-four percent.

Among Goods-Producing Industries:

(a) Construction is the only industry expected to show a faster-than-average growth.

(b) Manufacturing may increase by twenty percent.

(c) No change is expected in mining.

EXPECTED OCCUPATIONAL TRENDS IN THE UNITED STATES: 1960-1970

(a) Professional, technical and kindred workers are expected to show the sharpest relative increase—up sixty-five percent.

(b) A gain of fifty-one percent is expected in the number of service workers.

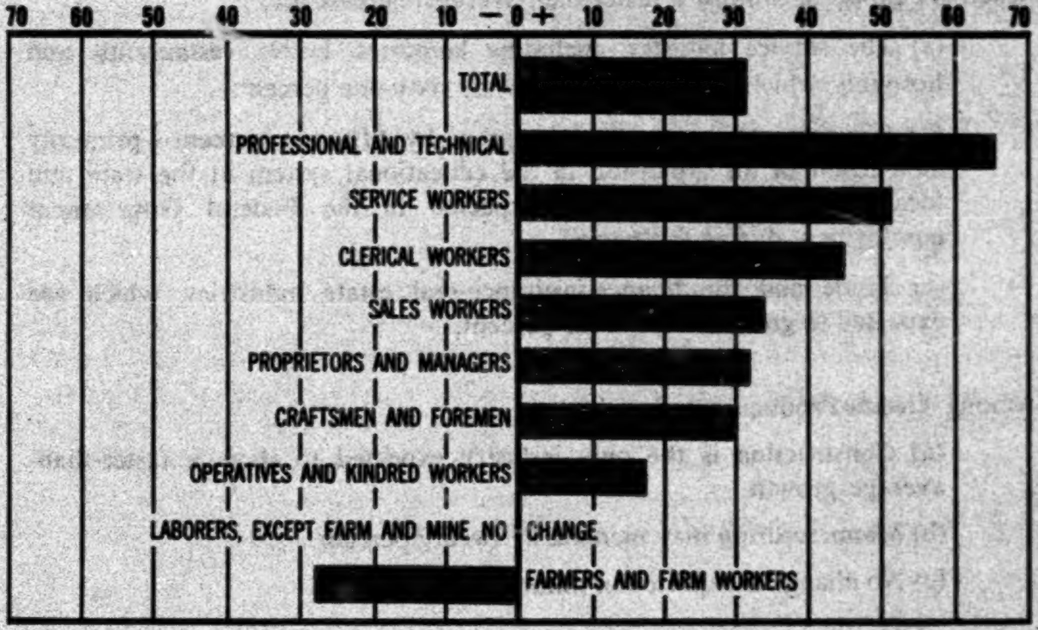
(c) No change is expected in the number of unskilled workers.

(d) Farm workers may contract by nearly twenty-eight percent (in line with the long-run secular trend).

(e) Among blue-collar workers, skilled workers will have the most favorable outlook—a two and one half million increase is expected in the 1960-1975 period—rising to more than eleven million by 1975. Among those occupational groups related to the machinist trade, the demand for mechanics and repairmen to install and maintain complex equipment may result in a one million increase by 1975. Relatively rapid employment gains are expected among skilled metal workers, particularly tool and die makers and instrument makers.

Thus, we see that despite our focus of attention on the areas of unemployment, we may find ourselves facing a situation of shortages of skilled craftsmen in the not too distant future. DURING THE PAST DECADE DESPITE RECORD EMPLOYMENT TOTALS, WE HAVE ALSO WITNESSED A RISING PLATEAU OF UNEMPLOYMENT. MOST OF THE JOBS CREATED DURING THIS PERIOD ARE JOBS FOR WHICH FEW UNEMPLOYED WORKERS ARE QUALIFIED IN TERMS OF EDUCATION, SKILL, OR TRAINING.

Projected Change in Employment in Major Occupational Groups, 1960-75
Percent Change



THE RISING EDUCATIONAL LEVEL OF THE LABOR FORCE

Since 1940, the proportion of workers completing four years of high school or more has risen seventy percent. During the same period, the proportion of workers completing four years of college or more nearly doubled—rising from six to eleven percent. Education and training are the two most important factors for the job seeker. Increased schooling has enabled us to lead useful and meaningful lives. In an era of rapid technological advancement, the trained worker is more adaptable to changes in industrial conditions. It is a means to a better job, and in many cases is the difference between having or not having a job. Education is the best means for developing the full potential of our labor force, and is a primary key to full employment.

Since the end of the Second World War, educational requirements, for many occupations, have steadily risen. In part, this merely reflects the fact that our expanding work force as a whole has become better educated. The fact that a much larger absolute number, as well as a higher percentage, of our young people are going to school and staying in school longer, has been well documented in numerous studies by the Department of Health, Education and Welfare, the Census Bureau, and the Labor Department. At the same time, youth unemployment remains a major factor today. A large proportion of today's jobless youth are school drop-outs. During the 1960's, some seven and one-half million youngsters will enter the job market without having completed high school. At the same time, a high school diploma is increasingly a minimum requirement to get a job in many fields.

This problem will become most acute within the next few years, as one and one-half million of these drop-outs enter the labor force for the first time. We need to create over twenty million new jobs between now and 1970, merely to prevent a worsening in the unemployment situation. If the economy does not generate more employment than it has for the past decade, unemployment in 1970 could conceivably run as high as nine million persons or eleven percent of the labor force.

As shown by the data on Table E—there are wide differences in the level of education among different occupation groups. The average professional or technical worker (which includes many occupations not normally requiring a college degree—i.e., technicians, musicians, and actors) has completed more than four years of college. Most other white-collar workers have the equivalent of more than four years of high school—followed closely by skilled workers (who average slightly over three years of high school). It is important to note that *two-thirds of the unemployed in March, 1962 (latest data available) did not finish high school.* (See Table F).

PRODUCTIVITY TRENDS DURING THE POST-WAR PERIOD

Since the end of the Second World War, the average annual increase in productivity (as measured by changes in output per manhour) has been 3.0 percent a year. (See Table G). This is well above the long-run average of 2.4 percent recorded during the 1909-63 period. In fact since 1960, the average annual gain has been closer to 3.5 percent. These gains have not been uniform throughout the economy. The most rapid productivity gains have occurred in agriculture, manufacturing, mining, transportation-communications, public utilities. Less-than-average gains were noted in the trade, finance, service, and construction industries. The rising educational level of the work force is one of the primary factors which have allowed the labor force to adjust to the changing technology. The Council of Economic Advisors, in its 1964 Annual Report, estimates that "the average educational attainment of new workers currently entering the labor force is about forty percent higher than that of those workers currently retiring."

AUTOMATION: ITS ORIGIN AND IMPLICATIONS

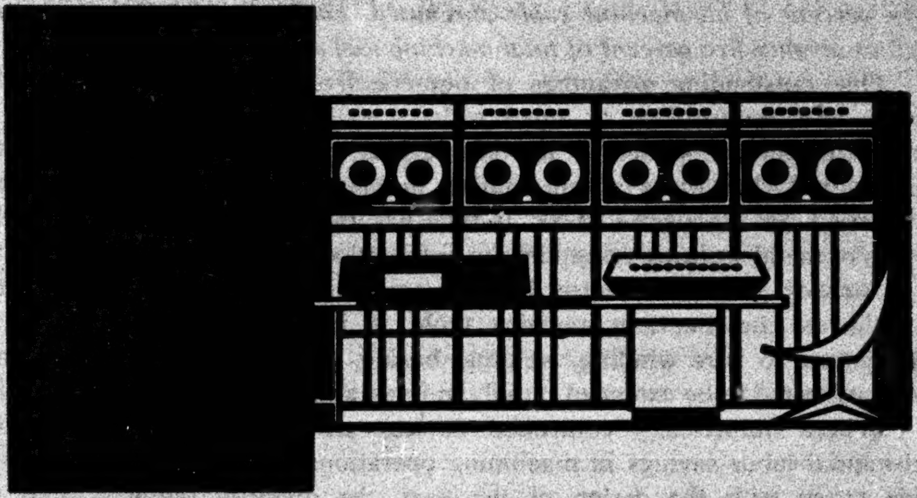
A discussion of past-war productivity trends would not be complete without a brief mention of automation and its general impact on employment. The term "automation" was originally coined to describe technological advances in production line techniques used in the auto industry. Although there is no universally accepted definition of the term "automation," it has since taken on a much broader application today. Automation is generally used in describing changes in productive techniques (including the area of material handling) which results in an increase in output with either a stable or declining work force. The term automation, when used in the electronics industry, involves the concept of "feedback control." Feedback control is a technical process for correcting errors, which is carried out continuously and automatically by machines. There are electronic devices which almost parallel the human nervous system, and allows the machines (usually electronic computers) to function in a decision-making process. Without getting overly involved in the technical aspects of automation, let us quickly glance at some of the general effects which can be ascribed to automation. They are:

(1) a decrease in the relative number of unskilled and semiskilled jobs and certain routine clerical jobs.

(2) increased demand for skilled maintenance workers.

(3) creation of new occupations particularly associated with electronic data processing.

(4) an accelerated need to update and upgrade existing journeyman skills.



AUTOMATION AND SKILLED TRADES IN THE IAM

Automation is much more than an abstract or theoretical concept; it involves jobs and people. The impact of automation has already begun to be felt in the small machine shop. Yet, we must be aware of the fact that the heaviest impact is still to come—particularly in the area of numerically controlled machine tools in the metal working industry. Numerical control is a technique used to operate machine tools and certain other types of equipment by means of numerically coded information recorded in advance on punched cards, magnetic tape, or punched paper tape. Fed into a system of electronic interpreting devices, the information from the tape or cards can, with little human assistance, control a machine tool as it goes through a sequence of cutting operations. Once developed, the coded information—which is sometimes prepared with the help of a computer—can be stored for future use or used on another machine elsewhere to produce an identical part.

First commercially used in 1957, numerical control is still in an early stage of development and use. About three thousand numerically controlled machine tools were estimated to have been installed by early 1963, but these represented only a tiny portion of the total of about two million machine tools then in place.[1] Three-fourths of the new tools were in the aerospace and machine-tool producing industries, but there are at least a few in almost every major metal working industry. *Some experts believe that within a few years numerically controlled machine tools may represent thirty*

---

[1] NUMERICAL CONTROL SHOWS RECORD GROWTH", *American Machinist*—Metal-Working Manufacturing, Vol. 107, No. 15, July 22, 1963, pp. 71-76. This estimate was based on a survey of industries using these tools, and is somewhat higher than the number estimated by the Department of Commerce, which is based on the number shipped between 1954 and June 30, 1962.

to fifty percent of all machine tools purchased, and that this total may reach as high as seventy-five percent of total machine tool sales by 1970.

One outstanding advantage of numerically controlled devices is their flexibility and applicability to small orders, which form a large proportion of total machine shop work. In this respect, numerical control contrasts sharply with earlier types of automation in metal working industries, which were devised for mass production. It thus has the effect of greatly extending the areas of metal working susceptible to automation.[2]

Already numerical control is being applied to many types of operations in addition to metal-cutting machine tools. A beginning has been made in its application to wire winding, welding, boring, drafting, and inspection, and its use is expected to be extended rapidly in these and other areas.

Where numerically controlled devices are installed, they can result in substantial labor savings in machining operations, the amount varying over a wide range with the design of the part, the quantity required, and the methods previously used. However, a new job category, that of parts programmer, has to be added to work out the coded instructions which are punched in the control tape or cards. Maintenance work is also increased, since the electronic circuitry, as well as the tool's mechanical structure, must now be serviced. In some instances a knowledge of hydraulics is also important in maintenance.

A recent article in the *American Machinist*[3] assessed the probable impact of numerically controlled machine tools on the metal working industry. Some of the highlights of this article were as follows:

1. Nearly one-half million workers now in the metal working field will be directly affected by new technology in the next ten to twenty years.
2. Industry's need for maintenance workers will double by 1980.
3. There will be a sharp increase in the demand for parts programmers to prepare instructions for numerically controlled equipment.
4. As a result of a sharp increase in productivity, there will be a continued decline in the number of semiskilled and unskilled employed in the industry.

The 1964 Manpower Report of the President brought out many general manpower implications of technological change. This report stated that the typical job of the production worker in the future will be that of a *machine monitor*. They will have the responsibility for supervising complexes of automatic equipment, controlling an integrated system of conveyors and processing machines, or monitoring elaborate instrument control panels and recording information for interpretation. More and more the operator will become a skilled watchman, with functions demanding patience, alertness to malfunctioning, a sense of responsibility for costly equipment, and a better educational background than was needed in the past by factory workers. A numerically controlled machine operator is clearly a more highly skilled workman. In many instances, it will mean a broadening of skill levels. His hourly rate should reflect this difference. We cannot allow employers who shift journeymen into numerical control to downgrade rates.

---

[2] This point has been stressed in earlier articles on the subject of numerical control including "HOW TO GET READY FOR NUMERICAL CONTROL" by Kenneth G. Wood, *American Machinist*, February 23, 1959, pp. 103. This article stated, "Numerical control is automation of a different type and order than is found in mass-production factories. Here there is multi-purpose flexibility in one piece of automatic machinery. Within the size capacity of any machine an infinite variety and shape of parts can be made. Low and intermediate volume production is where numerical control will show the best advantage. Tolerance to almost any fineness can be achieved numerically."

[3] "METALWORKING IN 1980," *American Machinist*, December 9, 1963—pp. 81-85.

With respect to maintenance and repair workers, there will be a growing need for workers to service and repair electronic equipment, instruments and automated machinery. Plants that automate will attempt to keep this costly equipment operating as near continuously as possible.

Many instrument repairmen and business machine servicemen need post high school education in fundamentals of engineering, mechanics, and electronics in order to service the complex instruments and office machines coming into use.

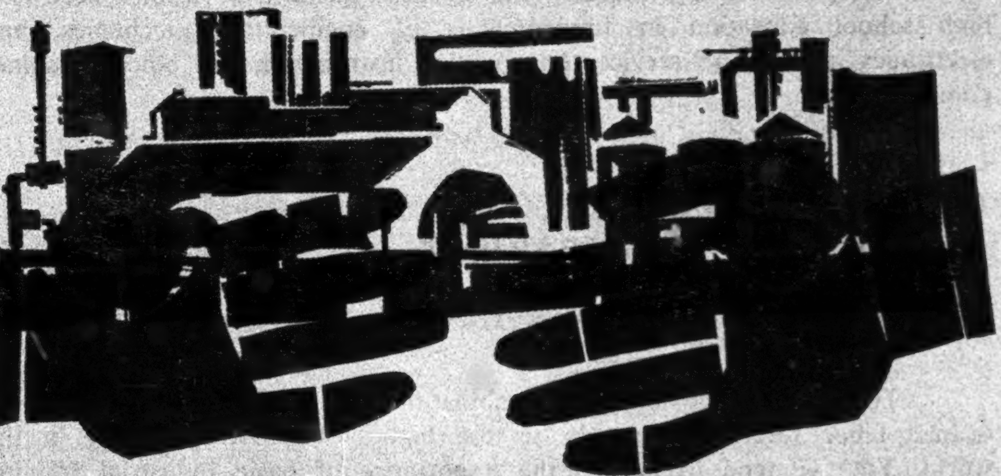
CHANGES IN TECHNOLOGY AND THE NEED FOR TRAINING

Technological advances in combination with a highly skilled and well trained labor force has brought us the highest standard of living in the world. Yet, we tend to neglect the importance of basic industrial training in our society. Vocational and industrial education ranks near the bottom of the list in terms of social prestige. While stressing the need for education as a primary means of combating the vicious cycle of low skill, unemployment (or underemployment) and poverty, employers are failing to meet their responsibilities in this area. They are reluctant to establish training programs in which their employees develop marketable skills that can be utilized by another firm. Many of our most highly skilled crafts are in extremely short supply at a time when joblessness remains at intolerably high levels. These shortages are expected to become even more acute in the near future. (See Table H showing trends in apprenticeship among skilled jobs associated with the IAM in the Technical Appendix at the end of this study). Some of the shortages are in occupations that were not even in existence fifteen years ago. For example, the National Science Foundation recently projected that the number of technicians in the aerospace industry would more than double during the 1960's—rising from fifty thousand to one hundred ten thousand.

At the same time, journeymen skills are rapidly changing. A knowledge of basic electronics, circuitry, mathematics, hydraulics, and basic engineering is becoming necessary to keep up with changes in technology. There is a definite need to expand training programs which are designed to both update and upgrade journeymen skill levels.

Factors which have affected the utilization of manpower during the decade of the 1950's and thus far the early 1960's will have an even stronger impact in the coming years. Demographic changes, industry and occupation shifts, advances in technology, trends in unemployment, and developments in the educational field, all have a direct bearing on manpower development and training. These factors become even more complex when viewed against a background of both long-term economic trends and the short-run business cycle.

With these developments in the background, let us now turn our attention to a brief review of the experience of other craft unions in the field of training.



APPRENTICESHIP, TRAINING AND RETRAINING . . . THE EXPERIENCE OF OTHER CRAFT UNIONS

Craft unions, including the IAM, have historically provided a major impetus in the area of training and retraining through registered apprenticeship programs. The building trades and graphic arts unions have been the strongest advocates of formal apprenticeship programs. A recent article in the *Monthly Labor Review* (January, 1964) stated "Unionists in the mass production industries, with the exception of some like the International Association of Machinists, have not been overly concerned with such training."

Among the other unions that have been most concerned with apprenticeship and training are the Electrical Workers (IBEW), the Plumbers (UA), and the Printers (ITU).

The IBEW has a skill improvement program which is financed by the Union. This has been in effect since the Summer of 1959. Since that time, nearly twenty thousand journeymen have attended evening skill improvement classes. They have a two-year course developed by the International for locals, which are divided into four eighteen-week semester units. To complete a unit, a student is required to attend a three-hour session one night a week and pass a written exam before moving on to the next unit. The International provides workbooks and manuals, the students pay some $15.00 to $20.00 for their own supplies and the locals furnish instructors and classrooms. Enrollment is voluntary. The program covers a variety of general skills, but is also adaptable to updating journeymen's skills in specific electrical operations.

The Plumbers and Pipefitters Union has negotiated an employer-financed fund to be used to supplement local joint-apprenticeship and journeyman committee programs. This program has been in effect since the mid-1950's.

The National Contractors Association pays two and one-half cents per manhour into a special fund, which is used to purchase educational equipment, pay for instructor's salaries, and provide the basis for grants to local joint-committees. Courses of instruction have been offered in such areas as studying pipefitting operations in relation to control panels.

Both of these organizations have made extremely good progress in upgrading the skill level of their journeymen. Due to enthusiastic membership response, both organizations have not been able to meet all the demands for training placed upon them. Lacking sufficient funds, facilities, and instructors, they have not been able to train all those who applied.

In January, 1962, The International Typographical Union (ITU) opened a graphic arts center in Colorado Springs, Colorado. It is a training center designed to train members in the many technological changes being introduced into the printing and publishing industries. Approximately twenty separate training courses are offered at the center. Programs last about three weeks.

RECENT IAM PROGRAMS IN THE FIELDS OF APPRENTICESHIP AND TRAINING

The IAM has always deeply been committed to the concept of training as a means of developing skills. We have historically approached this subject through our stress on apprenticeship. In addition, recent advances in technology have led us to broaden this concept. We have many programs in existence today that are designed to upgrade the skill level of members who have already achieved journeyman status.

As noted earlier, automation is already beginning to have an impact on the employability of journeymen. This is particularly true in the electronics industry. We are aware of the fact that a "constant process of learning" is necessary merely to keep up with changes in technology. Let us now quickly look at some of the recent IAM programs which reflect this point of view.

In early 1962, for example, acting upon the recommendations of the

Standing Electronics Committee, the IAM approved an educational program in electronics courses designed to upgrade the skills of IAM members in California. In addition, plans were developed to set up union sponsored classes for IAM auto mechanics in such fields as transistor ignitions, alternators, disc breaks, and gas turbines. IAM Representatives met with state officials and completed plans for required courses with the State furnishing text books and teachers' salaries. Courses were developed in fundamentals of machine control systems, basic electronics, shop math and other courses. District Lodges 727 (Burbank) and 50 (San Diego) have been particularly successful in establishing these courses and have held many of these training sessions in the Union Hall. This has helped to overcome membership resistance to attending classes under a more formal setting and has given them a closer identification with the IAM. In these cases, we are literally "training workers today for the jobs of tomorrow."

At Santa Monica, California, more than seven hundred workers recently applied for admission to a ten-week course in automated machine operation under the direction of IAM District 1578. This course was arranged in answer to a demand for training in the installation, operation and maintenance of automated machinery. The District prepared the course in cooperation with the California State Bureau of Industrial Education.

Lodge 946, at the Aerojet General Solid Rocket plant at Sacramento, California, negotiated a training program to give members broad experience on many of the special machines in use at the plant. This program was designed to sharpen and diversify members' skills.

A pre-apprenticeship program for the machinists and tool and die trades has been established by IAM Lodge 113 and District 8 in Chicago, Illinois. This program, which is one of the first of its kind in the trade, is financed under the Federal Manpower Development and Training Act. A program was initiated in the Spring of 1963, and allows young men between the ages of eighteen and twenty-four (all of whom were unemployed) to receive forty-eight weeks of training or the equivalent to the first year of a tool and die apprenticeship program. The program is conducted at the Washburne Trade School in Chicago. One hundred and ten trainees are learning and working six hours a day, five days a week and receive a $20.00 a week subsistence allowance as provided under the Act.

Machines and equipment used in the course were either donated by employers in the Chicago area or purchased at cost by the vocational education system. The Illinois State Employment Service selected the trainees on the basis of aptitude tests. After completion of the program, placement in apprenticeship programs will be handled jointly by the Bureau of Apprenticeship and Training and the State Employment Service.

A pilot program has recently been established in the printing machinery industry in New York City between the Publishers Association of New York and District 15. It is designed to train members on the installation and maintenance of new equipment in the printing industry. Recent technological advances in this industry include the introduction of high speed typecasting and setting machines, improved photographic equipment, as well as new packing, addressing, stacking and auxiliary equipment.

These are but a few of the areas of training and retraining in which the IAM is actively engaged today. However, they represent current organizational programs in this area. They reflect the realistic position we have taken with respect to automation and technological development.

THE NEED FOR APPRENTICESHIP AND TRAINING PROGRAMS IN THE IAM

The International Association of Machinists believes that a formal apprenticeship program is the best means of obtaining a level of competence commensurate with the title journeyman. This is true of all skilled occupational groups normally associated with the IAM—machinists, tool and die makers, electronic technicians, auto and airline mechanics. However, we also recognize the fact that many workers achieve journeyman status by many different means other than through an approved apprenticeship program. These include "picking up or stealing the trade," schooling, Armed Forces training, or some combination of these methods.

In April, 1963, the Bureau of Census with the technical assistance of the Bureau of Labor Statistics, conducted a special survey for the Office of Manpower, Automation, and Training designed to obtain information on how workers learned their current job. This survey covered approximately fifty-five million workers in the labor force between the ages of twenty-two and sixty-four who had completed less than three years of college. Detailed information was included in this survey on three skilled occupational groups closely associated with the IAM—machinists, airplane mechanics, and auto mechanics. Summary results of this survey are as follows:

Training Programs Taken by Machinists, Airplane and Auto Mechanics[4]
(Percent Distribution)

	Machinists	Airplane Mechanic	Auto Mechanic
Number of Programs (in thousands)	732	777	1,727
Percent	100.0	100.0	100.0
Type of Training Program (Percent Distribution)			
High School[8]	21.2	10.7	41.6
Junior College	2.3	0.9	0.6
Technical Institute	5.9	7.2	4.4
Special School	14.4	8.1	16.0
Apprenticeship	34.9	2.8	6.3
Company School	6.7	6.8	3.4
Armed Forces	10.7	60.9	21.6
Correspondence School	3.8	2.6	6.1

[4] Persons in the civilian labor force 22 to 64 years old who completed less than three years of college, April, 1964. The survey required a minimum of 100,000 persons who took training. Training programs stilll taken in April, 1963, are excluded.

[8] Includes vocational and commercial schools.

Source: *Manpower Report of the President—March*, 1964,—Table F-9—pp. 256.

As shown by this summary tabulation, apprenticeship training programs were reported most frequently for machinists—about thirty-five percent. Three out of every five programs for airplane mechanics included Armed Forces training. Among auto mechanics training programs, high school (including vocational education) was the primary means of learning the job. Most individuals in this survey reported more than one method of acquiring the training necessary to perform at their jobs.

These factors reflect the fact that there are many different ways in which workers acquire skills. They also point out the accelerated need for training programs as a means of avoiding any further dilution of our trade.

Assuming that the future supply of skilled manpower is directly related to the number of persons engaged in apprenticeship programs, we can readily see that we have steadily fallen behind in supplying an adequate number of apprentices. (See Table H in Technical Appendix).

Within many trades under the IAM's jurisdiction, there are not enough apprentices in training to replace those journeymen who leave the trade, die or retire. There were fewer registered apprentice machinists in 1963 (8,000) than in 1956 (8,900). With about 350,000 machinists employed today, it is estimated that 7,000 new machinists are needed for replacement purposes alone per year. In 1962 (latest data available) only 1,000 persons successfully completed the apprenticeship program.

Much the same is true concerning the supply and demand of journeymen tool and die makers. The employment of tool and die makers—currently at about 150,000, is expected to rise to 185,000 by 1970. Despite the fact that deaths and retirement alone will provide about 3,500 job openings each year during the 1960's in this highly skilled field—only 1,400 completions were noted in 1962 under the apprenticeship program. Unless there is a substantial expansion in this program, the Labor Department estimates that only one-half of the needed tool and die makers will qualify through registered apprenticeship programs.

A similar pattern can be shown by comparing facts and figures in the automotive repair and aircraft mechanic fields with the number of registered apprentices.

There is an urgent need to both strengthen and expand the apprentice program within the IAM now. This fact was clearly reiterated by recent Executive Council action adopting the recommendations of the Third Permanent Apprenticeship Committee concerning the IAM Apprenticeship Policy Manual. A qualified staff member in each General Vice President's territory has been designated to act as an Apprenticeship Co-ordinator. We hope this will result in a strengthening of IAM programs in this crucial area.

RECENT LEGISLATIVE ACTS IN THE FIELDS OF TRAINING AND RETRAINING

Although the concept of training is not a new one to labor organizations, it is only within the past few years that the Federal Government has assumed a new sense of responsibility in this area. In this section, we will briefly discuss some of the recent legislative acts in the fields of training and retraining. It is our hope that wherever possible, IAM representatives will take advantage of these programs as a positive means of facing the manpower challenge of the 1960's within the limits of IAM manpower policies.

TITLE OF LAW:

Area Redevelopment Act
(Public Law 87-27)
87th Congress
May 1, 1964

PURPOSE OF LAW:

To help areas of substantial and persistent unemployment and underemployment to take effective steps in planning and financing their economic redevelopment.

TRAINING PROVISIONS:

Section 16-A; A-F. After a redevelopment area has an approved economic program, the Labor Department, working in close conjunction with both the Department of Health, Education and Welfare and Agriculture, shall determine the occupational training or retraining needs of unemployed and underemployed individuals residing in the redevelopment area. The Act calls for orderly section and referral of those individuals, and calls for close cooperation with existing state and local agencies relating to vocational training and retraining. If facilities are not available, arrangements may be made to work with public or private educational institutions.

TYPE OF TRAINING PROVIDED:

Training is provided on both an institutional as well as on-the-job training basis.

PROCEDURE FOR OBTAINING TRAINING—INSTITUTIONAL:

1—Overall economic development programs must be submitted and approved and certification or designation granted by the Area Redevelopment Administration of the Department of Commerce, which states that the area is an area which is eligible to receive benefits under the ARA.

2—At the local level, a training committee should be established. This committee should be composed of interested parties in the area including, usually, the manager of the local employment service office and representatives from education, labor, business, and agriculture. Our representative should contact members of this committee and indicate the need for a particular program in the area. We must assume, under these provisions, that members are either unemployed or underemployed and would qualify under the selection procedure. (*The need for labor participation in local advisory committees cannot be underscored enough. It is vital that programs not be approved in those occupations where there is a current over-supply or where they are designed to substitute for regular apprenticeship programs*).

3—The local employment service, after surveying local labor market conditions, would certify that there is a need for training in the occupation in the area. These plans would then be submitted to state representatives, who in turn would submit the entire package, including all necessary costs involved, to the Washington Office of the Bureau of Employment Security for final approval or rejection. Final approval is thereby tightly controlled by central authorities. This is to prevent such things as "run away plants."

Please note that on-the-job training programs under ARA are virtually non-existent—totaling only several thousand in the past three years.

DURATION OF TRAINING:

Training is not to exceed sixteen (16) weeks.

ALLOWANCES:

Allowances are equal to the amount of state insured average weekly unemployment compensation payments.

APPROPRIATIONS:

The training provision calls for a limitation of four and one-half million dollars annually. Retraining subsistence payments are separately appropriated and are not to exceed ten million dollars annually.

OCCUPATIONS COVERED:

Although training has been offered in virtually all major occupational categories, it is noteworthy that between July, 1962, and June, 1963, a little over fifty percent of all trainees were found in production occupations. Apparently, ARA courses, because of the limited duration, are best suited for training in semiskilled occupations. These production training courses were concentrated in two areas—textile products and metal working. Nearly a fifth of the trainees were in service occupations, particularly in the health field, (nurses aides, hospital orderlys, and the like). Clerical and sales courses accounted for one out of every ten in training—chiefly women.

LIMITATIONS AND MISCELLANEOUS COMMENTS:

The foremost of these is the fact that training under ARA is limited to redevelopment areas (a problem which has been partially overcome through the enactment of the Manpower Development and Training Act). Many of these jobs for which individuals are being retrained are in turn subject to displacement as a result of technological change. They tend to be jobs which are of a narrow specialty, which is a reflection of the fact that the duration of training is clearly too short. The whole program, with respect to appropriations is a mere drop in the bucket relative to the size of the problem.

We are failing to reach those unemployed persons with the greatest need. Trainees tend to be among the best educated and in prime working ages.

The entire ARA program has been so dissipated—by bringing in farm and rural areas—it is, therefore, unreasonable to expect that after just three short years, the program could have made a meaningful dent in the jobless picture. More concentrated effort in fewer areas would have produced a far more significant impact in meeting the purpose of this law.

With respect to training, we should view the funding for this program as being mere pilot study—a fact that has been brought out by the enactment and subsequent expansion of MDTA.

TITLE OF LAW:

Manpower Development and Training Act of 1962
(Public Law 87-415)
87th Congress S. 1991
March 15, 1962
and
as amended under
Public Law 88-214
88th Congress HR 8720
December 19, 1963

PURPOSE OF LAW:

To require the Federal Government to appraise the manpower requirements and resources of the Nation, and to develop and apply the information and methods needed to deal with the problems of unemployment resulting from automation and technological changes. To assist persons now unemployed or underemployed to qualify for re-employment by providing them with skills which are or will be in demand in the labor market. To provide retraining for workers whose jobs are being eliminated or radically changed by automation through upgrading and skill improvement courses.

TRAINING PROVISIONS:

MDTA procedures call for both, on-the-job training as well as institutional training programs.

PROCEDURE FOR OBTAINING INSTITUTIONAL TRAINING AND SKILL DEVELOPMENT PROGRAMS UNDER SECTIONS 201-204:

The Act requires that local advisory committees be established, composed of representatives of labor, business, local employment service office manager, local educational personnel, and in some instances agriculture. Requests for the establishment of a training program in an area should be directed through the local advisory committees. (*The need for labor participation at the local advisory committee level should also be emphasized at this point. There is a clear-cut need to protect the interests of IAM members to prevent an over-supply of skilled craftsmen in an area and at the same* *time be alert to the problem of fragmentation of the trade. If IAM representatives are not members of local advisory committees, at a minimum, they should at least maintain close liason with the designated labor representative).*

Priority is given to persons who are unemployed and underemployed, however, if it is expected that because of changes in technology, affected individuals may be expected to lose their jobs, these occupations too may be covered, even though workers are currently employed.

The local employment service, after surveying local market conditions, must certify that a need for the occupational training exists, and there is "reasonable expectation for employment" at the completion of this course. The local employment service representative will, in turn, contact appropriate parties at the local school board level to see whether such a program can be developed and work out the necessary curriculum. Working closely at the local level, both local employment service personnel and local educational personnel will then submit a training proposal to the state offices of their respective organizations.

At this point, State Advisory Committees, which are established for all states, review the proposal and submit to regional commissions for final action. It is at the regional level that these proposals are either approved or disapproved. Information is then sent to the National Office in Washington as a matter of a post review procedure and for funding purposes.

PROCEDURES FOR ON-THE-JOB TRAINING UNDER MDTA:

Under Section 204, the Secretary of Labor is encouraged to develop the adoption of on-the-job training programs by employers, trade associations, and labor organizations. The key feature of on-the-job training is the proximity of training to the work environment. It may include supplementary classroom instructions.

As in the case with institutional training, on-the-job training (or OJT) cannot be approved unless there is "reasonable expectation of employment." The State Employment Service must determine that training is proposed in occupations for which there is present or future need. It can be done in anticipation of technological developments. In fact, OJT may be used by labor unions to provide refresher, upgrading or skill improvement training programs (which must be open to both members and non-members) for employed workers who are in danger of losing their jobs because of technological change.

The first step to establish an OJT program is to file a Form OJT-1 (declaration of interest for conducting on-the-job training) with the closest office of the Bureau of Apprenticeship and Training. If it is determined that such a project is feasible, a formal application, including an outline of the training proposal, the hours of training and instruction, persons responsible for training, and all estimated costs should be filed. If approved, a contract must be signed between the training facility and a representative of the Bureau of Apprenticeship and Training for the Department of Labor. This allows Labor Department personnel access to information needed to see that all terms of the agreement are being met.

On-the-job training programs will not be approved: (1) where a labor dispute exists; (2) if the program is a substitute for existing training programs; and (3) cannot be used by firms moving from one area to another.

DURATION OF TRAINING:

There is normally a fifty-two week maximum for all MDTA training except an additional twenty weeks may be provided for persons needing basic educational training.

ALLOWANCES:

Allowances are not to exceed the amount of the average weekly unemployment compensation payments, up to a maximum of fifty-two weeks. Allowances are payable to unemployed heads of families or households who have had at least two years of gainful employment, or a member of a family in which the head of the household is unemployed. (Only one member of a family can receive a regular training allowance, but this does not include youths who are receiving a special youth allowance). Special allowances are also paid to youths between the ages of 17 and 22 years.

In the case of OJT trainees, they must be paid for time spent on the job. In this case, the training allowance would be reduced by the number of hours worked in relation to a standard work week, (which is usually set at forty hours). For example, given a state insured average weekly unemployment benefit level of $40.00 and an MDTA trainee working twenty hours a week at $1.50 per hour, the trainee earns $30.00 for time spent on the job. In addition, he would be entitled to an additional $20.00 which is the difference between the standard forty hour week and the time spent on the job. Where the standard work week is less than forty hours, the training allowance would be computed in the same manner, that is, the ratio of time on the job to the work week. Travel allowances are also allowed where facilities are not within reasonable commuting distance of the regular place of residence—not to exceed $35.00 a week or $5.00 a day (maximum of 10¢ per mile). An additional $10.00 per week can be added to the regular trainee's allowance when it is necessary to enable him to complete training. (This is designed to reduce the drop-out rate from MDTA programs.)

APPROPRIATIONS:

Between two and three million dollars is being appropriated annually through 1965, in the area of manpower research. The following represents funds appropriated for training purposes under MDTA:

(A) 161 million dollars, fiscal year ending June 30, 1964.
(B) 407 million dollars, fiscal year ending June 30, 1965.
(C) 281 million dollars, fiscal year ending June 30, 1966.

COURSES UNDER MDTA:

By June, 1964, close to seventy-five percent of the 35,500 persons who completed institutional training under MDTA were placed in jobs. This placement ratio is obviously much higher under the OJT provisions of the Act, although the absolute number of trainees enrolled in OJT is still relatively small. Training was approved in over five hundred different occupations. The largest number of trainees were enrolled in seven occupational groups, including several closely associated with the IAM. These were welders, auto mechanics, and general machine operators. We have no knowledge as to the extent to which IAM Lodges participated in the establishment of such programs.

LIMITATIONS AND COMMENTS:

Within the limited framework of its operations, MDTA seems to be accomplishing its goal. It is getting people back to work. We should not expect that it is the cure all to the problem of unemployment, it is far from this. In its early stages, it encountered many problems including lack of facilities, lack of instructors, and in many instances a poor response from the very workers it sought to help.

There are two unique aspects of the recent amendments to MDTA that should be pointed out: (1) is the recognition that an individual must be taught to read and write before he can be retrained; and (2) the new amendment provides for labor mobility demonstration projects, which may give us a little insight into the whole area of relocation of the unemployed.

One major criticism that has been levied at MDTA is the fact that they are training or retraining the "cream of the crop." (Some 60 percent of all trainees were in the 22- to 44-year-age category). There were relatively few young people and older workers enrolled in the MDTA programs. For example, young workers under 19 years of age accounted for less than 9 percent of MDTA trainees, but they represented 19 percent of the unemployed in 1963. Similarly, older workers, 45 years of age and over, represented only one-tenth of all MDTA trainees, but they accounted for nearly 30 percent of all jobless workers in 1963. This disparity is even greater when we look at the educational attainment of MDTA trainees in comparison with all unemployed persons. For example, nearly 60 percent of all MDTA trainees had better than a high school education. In sharp contrast to this figure, roughly two-thirds of all the unemployed did not finish high school.

Further, a detailed examination of the occupations for which training has been approved under MDTA reveals that there are many occupations which are of a relatively unskilled nature or in low paying service occupations. Many of these occupations are, in themselves, susceptible to advances in technology and automation. In addition, something must be done to reduce the drop-out rate for MDTA trainees. This figure stood at slightly over 25 percent during the fiscal year ending June 30, 1964.

On-the-job training programs under MDTA are still numerically insignificant—encompassing only about twelve thousand workers by the first quarter of 1964. This is indicative of the magnitude of the problem facing us.

In our own experiences, at the IAM, we have sometimes run across situations whereby employers have attempted to utilize MDTA programs as a substitute for regularly approved apprenticeship programs. We must keep a constant check to see that these programs are not misused so as to result in a dilution of the crafts associated with IAM. MDTA programs can be compared to a double edged sword. If effectively used, it can be of substantial benefit to upgrade the basic skill levels of IAM members. This allows them to effectively adjust to changes in technology and brings with it the expectation of better, higher paying jobs. On the other hand, we must be constantly on the alert to prevent any further fragmentation of the craft. Many of these training programs focus their attention on narrow job specialization. It is an area which requires both continuous labor participation and evaluation.

TITLE OF LAW:

Trade Expansion Act of 1962
(Public Law 87-794)
and amendment PL 88-205
December 13, 1963

PURPOSE OF LAW:

The purpose is to strengthen economic relations with foreign countries through the development of open trading in a free world. It provides special assistance to U. S. firms and workers who are adversely affected as a direct result of U. S. tariff concessions. We shall only concern ourselves with the aspect of worker assistance.

Before assistance may be granted, it must be certified by the U. S. Tariff Commission that unemployment is due to increased imports resulting from trade concessions. (Please note that although petitions have been filed with the U. S. Tariff Commission, no industries have thus far been certified). Training provisions of MDTA would be applicable in this instance.

PROCEDURE FOR OBTAINING TRAINING:

See information relating to MDTA.

DURATION:

Duration is not to exceed fifty-two weeks. If sixty years of age at the time of lay-off, worker may receive an additional thirteen weeks of allowance.

ALLOWANCES:

Cash allowances, which are 65 percent of the average weekly wage but not more than the national average weekly wage in manufacturing. Travel allowances are allowed where training facilities are not within commuting distance of the trainee's home. The trainee is allowed 10¢ per mile, but not to exceed $5.00 per day.

MISCELLANEOUS COMMENTS:

This was the first major Act which provided for relocation assistance, which would pay for the expenses of a move and provide a lump sum payment of two and one-half times the weekly manufacturing wage. It is only offered to heads of families who cannot find employment where they live and who have a genuine job offer in another area. The fact that no industries have been certified as being adversely affected by tariff concessions, precludes our evaluating any experiences that might arise under the provisions of this Act.

VOCATIONAL EDUCATION ACT OF 1963

This legislation supplements existing Vocational Education Acts. It provides a great deal more money for vocational education and much more flexibility in the occupations that the money can be used for. It provides federal money for vocational school construction. The money may be used to prepare persons in any occupation, not just those occupations listed under the old Acts (agriculture, home economics, trade and industrial, distributive and practical nursing). Money can now be used for business and office education and training for jobs that are *related to* agriculture and home economics. Money is no longer "earmarked" tightly by categories. For example, earlier vocational education acts stated that at least one-third of the money allocated for trade and industrial training must be spent on evening courses. This is not the case under the new Act.

Ninety percent of the funds appropriated by Congress will be allocated to the states for the general purpose of vocational education. The remaining ten percent will be used by the Office of Education for setting up grants to the States, non-profit organizations, and universities for research and experimental programs. After 1964, the new federal funds must be matched by the States on a fifty-fifty basis.

Special provisions of the Act relate to school drop-outs, as well as upgrading of skill levels. One-third of all federal money the State gets must be spent for construction or for vocational programs designed to help persons who have finished or left high school and who are available for full-time study. There are several experimental programs for youngsters under this Act. There is a work-study program in which the student goes to vocational education school full time and works no more than fifteen hours a week (earning up to $45.00 per month). This is essential to give him an opportunity to earn funds necessary to stay in school. It is not an on-the-job training program.

The other experimental program is a residential school plan that is designed to help young people get the full benefit of an education by living at school in those instances where their environment background is such that they are considered "culturally deprived." Additional funds are also set aside to improve vocational education teaching training.

APPROPRIATIONS

FISCAL YEAR	GENERAL PROGRAMS	SPECIAL PROGRAMS
1964	$ 60 million	$ ———
1965	118.5 million	30 million
1966	177.5 million	50 million
1967	225.0 million	35 million

Please note that these funds are in addition to the amounts authorized under the Smith-Hughes and George-Barden Acts, which amounted to nearly fifty-seven million dollars in the fiscal year of 1964.

CANADIAN LEGISLATION . . . THE TECHNICAL AND VOCATIONAL TRAINING ASSISTANCE ACT OF 1960

This Act defines technical and vocational training as "any form of instruction, the purpose of which is to prepare a person for entry into gainful employment in any primary or secondary industry or service occupation, or to increase his skill for proficiency therein in any of the following industries or occupations." These include agriculture, fishing, forestry, mining, commerce, construction, manufacturing, transportation, or communication. Also included are other primary or secondary industries or service occupations requiring an understanding of the principles of science or technology, except where such courses are clearly for university credit.

REASONS FOR THIS LEGISLATION

(1) Canada historically has relied upon the immigration of skilled workers to meet its manpower requirements. In recent years, shortages of skilled labour in Western Europe have resulted in the drying up of this major source of supply.

(2) Substantial increases in the number of young people entering the labour force requires an increased effort on skilled training. This legislation is divided into two primary federal—provincial agreements: (a) the technical and vocational training agreement (basic); and (b) the apprenticeship training agreement.

Under the basic agreement can be found nine different programs as follows:

Program 1 . . . Technical and Vocational High School Training Program.
Program 2 . . . Technician Training Program.
Program 3 . . . Trade and Other Occupational Training Program.
Program 4 . . . Training Program in Cooperation with Industry.
Program 5 . . . Program for the Training of the Unemployed.
Program 6 . . . Program for the Training of the Disabled.
Program 7 . . . Program for the Training of Technical and Vocational Teachers.
Program 8 . . . Training Program for Federal Departments and Agencies.
Program 9 . . . Student Aid.
    (1) Capital Expenditures Program.
    (2) Apprenticeship Training Program.

In this paper, we shall not attempt to discuss all of these programs, but restrict ourselves to those areas of primary interest to the International Association of Machinists.

Program 1—Since the beginning of 1961, about three hundred new technical and vocational high schools or major additions have been undertaken and completed, providing approximately one hundred thousand new student places.

Program 2—This program covers a wide variety of fields, including engineering, science, business, agriculture, and medicine. It usually provides for twenty-four hundred hours of instruction. Some eleven new schools offering programs at this level have been developed since the enactment of this law.

Program 3—This appears to be of particular applicability to the IAM, in that it is designed to: (1) assist employed persons wishing to upgrade their skills; (2) help those about to enter employment; and (3) provide training for those individuals wishing to retrain for changes in occupation.

To qualify for training under this program, you must be either a school drop-out or over the compulsory school attendance age Some forty-six new adult vocational training schools and seventy major additions to existing schools have been completed providing for about eighteen thousand additional students.

Program 4—This should also be of interest to the IAM members in that it provides for adult training in cooperation with industry. It is designed to provide for the training of supervisors and upgrading or retraining of persons who are employed—it is not intended to be a substitute for apprenticeship. This program has thus far been largely untapped.

Program 5—This is similar to our own MDTA program, in that it attempts to provide training for unemployed persons through stress on basic education, trade, technical, or occupational competence.

In the 1962-1963 period, about thirty-eight thousand persons were trained in over a hundred occupations at two hundred and twenty centers.

For additional information on the details of other portions of this Act not covered in this paper you may wish to contact the Technical and Vocational Training Branch of the Canadian Department of Labour in Ottawa, Canada.

Capital Expenditures Program—This portion of the basic agreement has had a substantial impact on the development of new technical and vocational facilities in Canada. Federal financial assistance is provided for all programs (seventy-five percent of which is paid by the Federal Government for expenditures made before March 31, 1963, and fifty percent thereafter).

APPRENTICESHIP:

Apprenticeship agreements, although dealt with under a separate agreement, have been in effect in most provinces for about twenty years in Canada. There are over twenty-one thousand apprentices registered in programs in nine provinces. The individual Provincial Departments of Labour are responsible for the registration, designation and requirements of each apprenticeable trade. The Federal Government provides reimbursement of fifty percent of all provincial expenditures for the training of apprentices in classes or their supervision on the job.

With respect to apprenticeship programs relating to the IAM, information supplied to us by the Department of Labour reveals that in 1963 there were approximately eight thousand registered apprentices in the auto repair mechanics and auto body repairmen categories—up substantially from registrations recorded ten years earlier. In the machinist trade between 1952 and 1962, there were only about four hundred and fifty registered apprentices. However, within the last year there has been a substantial upward spurt in this occupation and at the present time they reported that some seven hundred and fifty young people are now registered in the machinist trade. In addition, the Province of Quebec reported some five thousand apprentices in the mechanical trades.

The Labour Department reported that, as in the United States, there is a fairly high drop-out rate in these programs—around twenty percent.

FINANCIAL CONTRIBUTIONS AND OPERATIONAL COSTS:

Since the enactment, over five hundred projects have been approved involving total capital expenditures of about five hundred and twenty million dollars—the Federal contribution has been well over half (three hundred and thirty million dollars). The Federal Government has agreed to continue to contribute seventy-five percent towards the construction and equipment of vocational training facilities equal to a contribution of four hundred and eighty dollars for each person in the fifteen to nineteen age group or until March 31, 1967. After this four hundred and eighty dollar figure is reached, the contribution will drop to fifty percent of provincial expenditures. In the case of the Federal contribution under Program 5 (training of the unemployed) the Federal contribution for training allowances has been increased to ninety percent.

SUMMARY

In this study, we have attempted to look at the economic background relating to manpower utilization. We have experienced four post-war economic recessions. These down-turns, historically, have been borne heaviest by the blue-collar factory workers. In addition, we have attempted to review some of the major factors affecting manpower utilization during the post-war period, including population and labor force developments, occupation and industry shifts, unemployment trends, technological changes, and the rising educational level of the labor force. All these factors have had a direct bearing on the IAM. They will be even more important in the coming years.

The IAM has traditionally taken an active role in worker training. We have briefly examined some of our own recent experiences as well as that of other craft unions in this area. We recognize the fact that future manpower requirements can only be met by taking positive action now. This is particularly true in light of expected technological advances affecting skilled occupations historically associated with the IAM. We have also examined recent developments in the apprenticeship program as it relates to the broader IAM manpower policy.

Finally, we have discussed recent Federal legislation in the fields of training and vocational education. It is clearly beneficial for IAM members to take advantage of existing Federal legislation in these fields as a primary means of fostering a broadening of skill levels. Yet, we must constantly be on the alert to prevent employers from misusing these programs by fragmenting skilled crafts associated with our Organization.

In order to best serve our membership, it is vital that we activate a positive IAM manpower policy. Let us implement this policy by focusing attention on a revitalized apprenticeship program and training programs designed to update and upgrade skill levels.

TECHNICAL APPENDIX AND STATISTICAL TABLES

Let us now quickly glance at each post-war recession in order to gain some additional insight as to the nature of the post-war business cycle.
A brief analysis of each Post-War Recession—

A. 1948-1949:

1. *Peak*[1]—November, 1948 *Trough*[1]—October, 1949 *Duration*—11 months
2. *Net Change in GNP:*[2] decrease of $4.3 billion (every mild decline)
3. *Principal Factors:* Slowdown in housing and retail sales—sharp inventory decrease ($10 billion)
4. *Unemployment Rate:*[3] rose to 6.8 percent of civilian labor force in August, 1949

B. 1953-1954:

1. *Peak*[1]—July, 1953 *Trough*[1]—August, 1954 *Duration*—13 months
2. *Net Changes in GNP:*[2] Fell $13.8 billion (moderate)
3. *Principal Factors:* Sharp drop in Federal Government expenditures on final goods and services (—$12 billion—end of Korean War). This induced decline in consumer durable expenditures—which stimulated inventory fall
4. *Unemployment Rate:*[3] 6.1 percent of the civilian labor force in August, 1954

C. 1957-1958:

1. *Peak*[1]—July, 1957 *Trough*[1]—August, 1958 *Duration*—9 months
2. *Net Change in GNP:*[2] Decrease of $19.4 billion (deepest post-war recession)
3. *Principal Factors:* Decrease in Federal Government expenditures; inventory disinvestment and reductions in business expenditures for plant and equipment. Brunt of recession felt in durable-goods manufacturing.

Footnotes:

[1] Dates shown represent business cycle turning points designated by the *National Bureau of Economic Research*. Actual highs and lows for other economic indicators (i.e., employment, unemployment, production, hours of earnings, etc.) may have occurred in different months.

[2] The net change shown in GNP in this outline represents—quarterly changes which have been seasonally adjusted at annual rates—in terms of 1954 dollars. (Source: U. S. Department of Commerce, *Survey of Current Business*.)

[3] Relates to rate of unemployment reached during the recession trough. All monthly unemployment rates referred to have been adjusted for seasonality. Unemployment rate referred to in 1948-49 recession relates to September, 1949, as October figures (trough) strongly affected by strikes in coal mining and steel industries. (Source: U. S. Department of Labor, *Monthly Report on the Labor Force*.)

4. *Unemployment Rate:*[3] 7.4 percent of civilian labor force in April, 1958—one of highest since early 1940's.

D. 1960-1961:

1. *Peak*[1]—May, 1960 *Trough*[1]—February, 1961 *Duration*—9 months
2. *Net Change in GNP.*[2] Fall of $10.2 billion (relatively mild)
3. *Principal Factors:* Decline in consumer durable expenditures; cessation of huge inventory accumulation following 1959 steel strike: drop in residential construction.
4. *Unemployment Rate:*[3] 6.9 percent of civilian labor force in February, 1961. Unemployment has not fallen significantly below 5 percent of the labor force since the Fall of 1957.

A SUMMARY OF FOUR POST-WAR BUSINESS CYCLES REVEALS—

(1) The expansionary phase preceeding the first three post-war recessions were unusually long (between 3 and 4 years each). The most recent decline (1960-61), was preceded by the shortest recovery period. However, we are currently in our 47th consecutive month of recovery, which is the longest recovery period in the post-war cycle. All indications point to a continuation of this up-trend through the first half of 1965.

(2) All four contractions were quite short and relatively mild in terms of the amplitude of the swing.

(3) Inventory disinvestment—primarily affecting consumer durables—have been significant in all the post-war contractions. The largest reductions in inventories were noted in the 1948-49 and 1960-61 contractions.

(4) In the second and third downswings, the Federal Government actually played a major destabilizing role by suddenly reducing its expenditures for goods and services.

(5) Rising personal income, continued personal consumption expenditures for services, and the operation of such built-in stabilizers as unemployment insurance throughout the 4 post-war declines have served to moderate the gross falls. On the other hand, the sudden slackened aggregate consumer demand for goods (largely durables) have been primary factors inducing sharp inventory cutbacks and a subsequent reduced level of business activity.

Table A

UNEMPLOYMENT RATES BY SELECTED MAJOR OCCUPATION GROUP IN 4 BUSINESS CYCLES
(Seasonally adjusted [1])

Year and month	All workers	Clerical workers	Sales workers	Craftsmen and foremen	Operatives	Nonfarm laborers	Service workers except domestic
1948-50							
October, 1948............(P)—	3.6	2.0	3.1	3.0	3.9	7.0	5.1
October, 1949............(T)—	7.8	4.5	3.8	8.6	10.9	17.7	7.9
July, 1950..............(R)—	5.1	3.2	3.5	4.6	6.6	9.4	6.8
1953-55							
July, 1953..............(P)—	2.7	1.9	2.9	2.3	3.2	5.7	4.4
July, 1954..............(T)—	5.8	3.1	3.4	5.1	7.9	12.1	5.9
April, 1955.............(R)—	4.6	2.6	2.1	4.6	5.8	10.7	6.0
1957-58							
July, 1957..............(P)—	4.2	2.9	2.3	3.9	6.3	9.8	5.4
April, 1958.............(T)—	7.3	5.0	4.1	7.2	12.1	15.7	7.7
January, 1959...........(R)—	6.0	3.6	4.3	5.9	9.0	13.6	6.9
1960-61							
April, 1960.............(P)—	5.1	3.7	3.4	5.0	7.3	11.1	5.7
January, 1961...........(T)—	6.6	3.9	4.4	6.6	10.3	15.8	6.7
October, 1961...........(R)—	6.8	4.9	5.9	5.5	9.3	13.8	7.7

---

[1] Seasonally adjusted occupational data are available only for the first month of each quarter.

Note:—Pre-1957 data for occupation groups based on old definitions of unemployment. The dates shown with a "P" represent the peak month of the business cycle; a "T" represents the official trough month; and "R" the eighth month of recovery from the official trough. Peaks and troughs have been officially designated by the National Bureau of Economic Research.

Source: *Unemployment: Terminology, Measurement, and Analysis* "Unemployment in the Early 1960's" a study prepared by staff members of the Bureau of Labor Statistics for the Subcommittee on Economic Statistics of the Joint Economic Committee, Congress of the United States: 1961—p. 63

Table B

UNEMPLOYMENT RATES BY INDUSTRY GROUPS IN 4 BUSINESS CYCLES

(Seasonally adjusted quarterly averages)

Year and quarter	Agriculture	Mining	Construction	Manufacturing			Transportation and utilities	Wholesale and retail trade	Finance and service[1]	Public administration
				Total	Durable goods	Nondurable goods				
1948-50:										
4th quarter 1948...(P)—	3.6	3.4	8.2	3.5	3.6	3.4	3.0	4.2	3.3	1.5
4th quarter 1949...(T)—	8.0	[2]22.7	13.6	8.0	8.5	7.6	6.6	6.5	5.2	3.2
2nd quarter 1950...(R)—	9.0	5.9	11.6	6.1	5.7	6.5	4.3	6.4	4.6	3.3
1953-55:										
3rd quarter 1953...(P)—	6.3	3.3	6.3	2.1	1.6	2.8	1.8	2.9	2.3	1.3
3rd quarter 1954...(T)—	8.4	16.0	11.3	6.7	6.9	6.4	5.2	5.9	3.9	2.4
1st quarter 1955...(R)—	7.1	9.5	9.7	4.9	4.7	5.2	4.3	4.7	3.5	1.9
1957-58:										
3rd quarter 1957...(P)—	5.8	5.1	10.0	5.1	4.9	5.5	3.1	4.4	3.2	2.2
2nd quarter 1958...(T)—	12.2	13.5	14.6	10.1	11.5	8.2	6.7	7.2	4.3	3.4
4th quarter 1958...(R)—	9.1	9.1	14.0	8.1	9.1	6.9	4.6	5.6	4.4	2.6
1960-61:										
2nd quarter 1960...(P)—	8.7	7.9	11.8	5.6	5.8	5.3	3.8	5.8	3.5	2.4
1st quarter 1961...(T)—	9.2	12.1	14.1	8.5	9.7	7.1	5.1	6.7	4.6	2.6
3rd quarter 1961...(R)—	10.4	10.8	14.3	7.6	8.1	7.1	5.0	7.5	4.7	3.1

[1] Includes domestic service workers.

[2] Unemployment rate exaggerated by misclassification of some workers.

Note: Data relate to experienced wage and salary workers. Pre-1957 data based on old definitions of unemployment. Also see note on Table A with respect to the "P", "T", and "R" designations. In this table, the quarter contains the month officially designated by the National Bureau of Economic Research as a turning point in the business cycle.

Source: Study Unemployment: Terminology, Measurement, and Analysis—p. 65

Table C

SHORT AND LONG DURATION UNEMPLOYMENT IN 4 BUSINESS CYCLES

(Seasonally Adjusted Quarterly Averages)

Year and quarter	Short term (less than 5 weeks)			Long term (15 weeks and over)			Very long term (27 weeks and over)		
		As a percent of			As a percent of			As a percent of	
	Number (In thousands)	Unemployment	Civilian labor force	Number (In thousands)	Unemployment	Civilian labor force	Number (In thousands)	Unemployment	Civilian labor force
1948-50:									
4th quarter, 1948 ....(P)—	1,293	56.7	2.1	299	13.4	0.5	107	4.7	0.2
4th quarter, 1949 ....(T)—	1,949	45.8	3.2	988	23.7	1.6	399	9.3	.6
2nd quarter, 1950 ....(R)—	1,554	43.5	2.4	902	25.1	1.4	429	11.9	.7
1953-55:									
3rd quarter, 1953 ....(P)—	1,096	63.2	1.7	178	10.4	.3	70	4.0	.1
3rd quarter, 1954 ....(T)—	1,670	43.9	2.6	995	26.4	1.5	400	10.4	.6
1st quarter, 1955 ....(R)—	1,349	44.1	2.1	837	26.5	1.3	414	13.5	.6
1957-58:									
3rd quarter, 1957 ....(P)—	1,505	51.4	2.2	544	18.8	.8	231	7.9	.3
2nd quarter, 1958 ....(T)—	1,892	38.1	2.8	1,526	30.9	2.2	607	12.0	.9
4th quarter, 1958 ....(R)—	1,688	38.7	2.5	1,587	36.0	2.3	831	18.9	1.2
1960-61:									
2nd quarter, 1960 ....(P)—	1,808	48.7	2.6	848	22.9	1.2	416	11.3	.6
1st quarter, 1961 ....(T)—	2,020	41.9	2.8	1,412	28.8	2.0	686	14.0	1.0
3rd quarter, 1961 ....(R)—	1,897	38.8	2.7	1,635	33.7	2.3	894	18.5	1.3

Note: See notes on Tables A and B

Source: Ibid, *Unemployment: Terminology, Measurement, and Analysis*—p. 60

Table D

CHANGES IN TOTAL U.S. LABOR FORCE, BY AGE AND SEX, 1960 TO 1975

(Numbers in thousands)

Age and Sex	Actual[1] 1960	Projected 1970	Projected 1975	Change, 1960-70 Number	Change, 1960-70 Percent	Change, 1970-75 Number	Change, 1970-75 Percent
BOTH SEXES							
14 years and over	73,081	85,703	93,031	12,622	17.3	7,328	8.6
14 to 24 years	13,697	19,861	21,787	6,164	45.0	1,926	9.7
25 to 44 years	31,878	33,235	37,023	1,357	4.3	3,788	11.4
25 to 34 years	15,099	16,709	20,806	1,610	10.7	4,097	24.5
35 to 44 years	16,779	16,526	16,217	—253	—1.5	—309	—1.9
45 years and over	27,506	32,607	34,221	5,101	18.5	1,614	4.9
45 to 64 years	24,127	29,128	30,510	5,001	20.7	1,382	4.7
65 years and over	3,379	3,479	3,711	100	3.0	232	6.7

[1] Alaska and Hawaii are included. The 1960 estimates for the labor force differ slightly from those derived from the monthly labor force survey because they were adjusted to be consistent with the revised 1960 population estimates published by the Bureau of the Census in Current Population Reports, Series P-25, No. 241.

Note: Individual items may not add to totals because of rounding

Source: *Manpower Report of the President—March, 1963*—p. 89

Table E

EDUCATIONAL LEVEL OF THE U.S. LABOR FORCE—MARCH, 1962

Occupational Group	Median years of schooling
Professional, technical, and kindred workers	16.2
Managers, officials, and proprietors, except farm	12.5
Clerical and kindred workers	12.5
Salesworkers	12.5
Craftsmen, foremen, and kindred workers	11.2
Operatives and kindred workers	10.1
Private household workers	8.7
Other service workers	10.8
Laborers, except farm and mine	8.9
Farmers and farm managers	8.8
Farm laborers and foremen	8.5

Source: *Manpower Report of the President—March, 1963*—p. 13

Table F

THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND EDUCATION—MARCH, 1962

Years of School completed	Number Unemployed (in thousands)	Percent Distribution	Unemployment rate
Total	4,049	100.0	6.0
Elementary School			
Less than 5 years[1]	303	7.5	9.7
5 to 7 years	513	12.7	8.3
8 years	646	16.0	7.2
High School			
1 to 3 years	1,087	26.8	8.3
4 years	1,122	27.7	5.1
College			
1 to 3 years	270	6.7	3.7
4 years or more	108	2.7	1.4

[1] Includes persons reporting no school years completed

Source: *Special Labor Force Report No. 30*
"Educational Attainment of Workers, March, 1962," U. S. Department of Labor, Bureau of Labor Statistics, Table 4, pp. 507 and Table B.

Table G

Average Annual Percent Change[1] in Output[2] Per man-Hour and Related Data, 1947 to 1963

Item	1947-63	1957-63
Total private economy:		
Output per man-hour	3.0	3.1
Output	3.4	3.5
Employment	.8	.6
Man-hours	.4	.4
Agriculture:		
Output per man-hour	5.7	4.9
Output	1.4	1.3
Employment	—3.3	—3.3
Man-hours	—4.1	—3.4
Nonagricultural industries:		
Output per man-hour	2.4	2.8
Output	3.6	3.6
Employment	1.4	1.0
Man-hours	1.1	.8

[1] Computed from the least squares trend of the logarithms of the index numbers.
[2] Output refers to gross national product in constant dollars.

Source: *Manpower Report of the President—March, 1964—p. 49*

Table H. REGISTERED APPRENTICES IN TRAINING, NEW REGISTRATIONS, COMPLETIONS AND CANCELLATIONS

(Totals Adjusted to Account for Reporting Revisions)

Trade	Year	In training at beginning period	New registrations[1]	Completions	Cancellations[2]	In training at beginning period
Machinists	1952	7,018	2,418	978	1,239	7,219
	1953	7,219	3,760	1,033	1,616	8,330
	1954	8,330	2,694	1,444	1,618	7,962
	1955	7,962	3,692	1,672	1,085	8,897
	1956	8,897	3,423	1,767	1,286	9,267
	1957	9,267	2,974	1,725	1,509	9,007
	1958	9,007	1,363	1,217	1,289	7,864
	1959	7,864	1,909	1,261	917	7,595
	1960	7,595	2,397	1,419	891	7,682
	1961	7,682	2,218	1,570	1,044	7,286
	1962	7,286	2,780	1,011	953	8,102
	1963	8,102				
Tool and diemakers	1952	5,324	2,247	635	781	6,155
	1953	6,155	3,966	786	1,101	8,234
	1954	8,234	2,853	1,714	1,253	8,120
	1955	8,120	2,920	1,510	724	8,806
	1956	8,806	3,538	1,995	899	9,450
	1957	9,450	2,509	2,322	1,902	7,735
	1958	7,735	1,275	631	545	7,834
	1959	7,834	2,235	1,613	864	7,592
	1960	7,592	2,515	1,830	913	7,364
	1961	7,364	2,171	1,690	903	6,942
	1962	6,942	2,808	1,339	955	7,456
	1963	7,456				
Automotive mechanics	1957[3]	6,046	2,654	857	1,729	6,114
	1958	6,114	1,221	689	1,331	5,315
	1959	5,315	980	616	1,014	4,665
	1960	4,665	958	653	1,144	3,826
	1961	3,826	1,063	532	895	3,462
	1962	3,462	1,236	559	773	3,366
	1963	3,366				
Automotive body builders repairmen	1957[3]	1,834	935	327	516	1,926
	1958	1,926	606	192	441	1,899
	1959	1,899	174	200	382	1,491
	1960	1,491	412	182	453	1,268
	1961	1,268	309	183	277	1,117
	1962	1,117	330	154	261	1,022
	1963	1,022				

[1] Includes Reinstatements. [2] Includes Suspensions. [3] Data for prior years not available. Source: Bureau of Apprenticeship and Training Division of Research

Table I

WHAT EACH STATE GETS UNDER NEW EDUCATION LAWS *

State	Junior Colleges and Technical Institutes (1964)	Other Colleges and Universities (1964)	Vocational Education (1964)	Vocational Education (1967)
	(in thousands of dollars)			
U. S. A.	$49,964	$177,817	$52,907	$198,404
Alabama	1,156	2,643	1,268	4,757
Alaska	34	136	63	237
Arizona	437	1,602	438	1,643
Arkansas	675	1,580	670	2,512
California	3,726	19,800	3,654	13,704
Colorado	488	2,083	506	1,897
Connecticut	505	2,397	559	2,098
Delaware	83	417	101	378
Florida	1,350	4,285	1,556	5,835
Georgia	1,231	3,278	1,547	5,800
Hawaii	235	665	213	798
Idaho	274	711	247	926
Illinois	2,090	9,207	2,312	8,671
Indiana	1,329	4,647	1,408	5,280
Iowa	932	2,900	858	3,217
Kansas	754	2,326	678	2,542
Kentucky	920	2,594	1,163	4,363
Louisiana	1,098	3,077	1,214	4,553
Maine	329	842	343	1,285
Maryland	753	2,871	839	3,147
Massachusetts	1,297	5,913	1,271	4,765
Michigan	2,267	7,968	2,185	8,193
Minnesota	1,171	3,844	1,051	3,943
Mississippi	742	1,985	861	3,228
Missouri	1,202	4,120	1,249	4,683
Montana	236	726	218	819
Nebraska	452	1,492	424	1,591
Nevada	53	234	66	249
New Hampshire	180	628	188	703
New Jersey	1,321	4,727	1,321	4,954
New Mexico	296	952	358	1,341
New York	3,337	16,134	3,691	13,842
North Carolina	1,625	4,261	1,864	6,989
North Dakota	276	726	236	882
Ohio	2,566	9,039	2,633	9,875
Oklahoma	822	2,603	843	3,163
Oregon	579	2,144	506	1,896
Pennsylvania	3,240	10,351	3,181	11,928
Rhode Island	222	862	260	973
South Carolina	859	1,971	1,011	3,791
South Dakota	253	715	241	902
Tennessee	1,216	3,308	1,374	5,183
Texas	2,703	8,953	3,328	12,479
Utah	354	1,473	328	1,230
Vermont	142	477	139	521
Virginia	1,103	3,257	1,509	5,659
Washington	872	3342	801	3,005
West Virginia	650	1,691	700	2,625
Wisconsin	1,236	4,166	1,155	4,333
Wyoming	101	347	95	357
Dist. of Columbia	91	1,227	184	690

* These estimates by the United States Office of Education indicate the amount of money available to each state if Congress appropriates the full authorization for the Vocational Education Act of 1963 and the Higher Education Facilities Act of 1963. This is in addition to grants under earlier legislation. Source: AFL-CIO American Federationist, March, 1964—p. 23

Table J

NONAGRICULTURAL WAGE AND SALARY WORKER EMPLOYMENT, BY INDUSTRY DIVISION, 1960 TO 1975

Industry Division	Employment (in millions)			
	Actual	Projected		Percent change,
	1960	1970	1975	1960-75
Total	54.2	67.7	74.2	37
Service-producing industries	34.0	43.7	48.8	44
Wholesale and retail trade	11.4	14.0	15.6	37
Government	8.5	11.5	12.8	51
Service and miscellaneous	7.4	10.2	11.9	61
Transportation and public utilities	4.0	4.4	4.5	13
Finance, insurance and real estate	2.7	3.5	3.9	44
Goods-producing industries	20.4	24.0	25.4	25
Manufacturing	16.8	19.2	20.3	21
Contract construction	2.9	4.0	4.4	52
Mining	.7	.7	.7	—

Note: Individual items may not add to totals because of rounding.
Source: *Manpower Report of the President—March, 1963*—p. 95

Table K

EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP, 1960 TO 1975

Major Occupational Group	Actual, 1960		Projected, 1970		Projected, 1975		Percent Change		
	Number (In millions)	Percent	Number (In millions)	Percent	Number (In millions)	Percent	1960-70	1970-75	1960-75
Total	66.7	100.0	80.5	100.0	87.6	100.0	21	9	31
Professional, technical, and kindred workers	7.5	11.2	10.7	13.3	12.4	14.2	43	16	65
Managers, officials, and proprietors, except farm	7.1	10.6	8.6	10.7	9.4	10.7	21	9	32
Clerical and kindred workers	9.8	14.7	12.8	15.9	14.2	16.2	31	11	45
Sales workers	4.4	6.6	5.4	6.7	5.9	6.7	23	9	34
Craftsmen, foremen and kindred workers	8.6	12.8	10.3	12.8	11.2	12.8	20	9	30
Operatives and kindred workers	12.0	18.0	13.6	16.9	14.2	16.3	13	4	18
Service workers	8.3	12.5	11.1	13.8	12.5	14.3	34	13	51
Laborers, except farm and mine	3.7	5.5	3.7	4.6	3.7	4.3	—	—	—
Farmers, farm managers, laborers and foremen	5.4	8.1	4.2	5.3	3.9	4.5	—22	—7	—28

Note: Individual items may not add to totals because of rounding.

Source: *Manpower Report of the President*—March, 1963—p. 100

Table L

COMPARISON OF UNEMPLOYMENT IN THE UNITED STATES AND CANADA

1951-63 Annual Averages

Year	Number (In thousands)		Unemployment Rate	
	U.S.	Canada	U.S.	Canada
1951	2,099	126	3.3	2.4
1952	1,932	155	3.1	2.9
1953	1,870	162	2.9	3.0
1954	3,578	250	5.6	4.6
1955	2,904	245	4.4	4.4
1956	2,822	197	4.2	3.4
1957	2,936	278	4.3	4.6
1958	4,681	432	6.8	7.1
1959	3,813	373	5.5	6.0
1960	3,931	448	5.6	7.0
1961	4,806	469	6.7	7.2
1962	4,007	391	5.6	5.9
1963	4,166	373	5.7	5.5

Source: International Labour Office Yearbook found in *Measuring Employment and Unemployment*, Report of the President's Committee to Appraise Employment and Unemployment Statistics, p. 256

Table M

CANADIAN EMPLOYMENT TRENDS IN THE POST-WAR PERIOD: SELECTED YEARS

(percent distribution)

Industry	Year		
	1962	1955	1946
Agriculture	10.5	15.2	25.4
Other Primary Industries	2.8	4.5	4.0
Manufacturing	23.2	25.6	26.0
Construction	6.9	6.9	4.8
Transportation and other Utilities	8.5	8.7	8.1
Trade	16.1	15.7	12.3
Finance-Insurance-Real Estate	4.0	3.3	2.6
Service	26.0	20.0	16.8
Total Employed	6,217	5,364	4,666

Source: Canadian Yearbook- 1963-64, p. 715

Table N

POST-WAR IMMIGRATION TRENDS TO CANADA, 1946-1963

Year	Total	Year	Total
1946	71,700	1955	110,000
1947	64,100	1956	164,900
1948	125,414	1957	282,200
1949	95,200	1958	124,900
1950	73,900	1959	107,000
1951	194,400	1960	104,100
1952	164,500	1961	71,700
1953	168,900	1962	74,600
1954	154,200	1963	93,200

Rounded to nearest 100

Source: Canadian Statistical Review, Historical Summary 1963 edition, Dominion Bureau of Statistics, Ottawa, Canada, Table 1, p. 3

Table O

CANADA. POPULATION, LABOR FORCE, EMPLOYMENT, AND UNEMPLOYMENT¹ ANNUAL AVERAGES, 1953—63

(Workers in thousands)

Year and Month	Population 14 yrs. of Age and Over	Labor Force	Employed	Unemployed
Annual average:				
1953	10,164	5,397	5,235	162
1954	10,391	5,493	5,243	250
1955	10,597	5,610	5,364	245
1956	10,808	5,782	5,585	197
1957	11,108	6,008	5,733	278
1958	11,387	6,137	5,695	432
1959	11,563	6,228	5,856	373
1960	11,769	6,403	5,955	448
1961	12,010	6,518	6,049	469
1962	12,234	6,608	6,217	391
1963	12,466	6,737	6,364	373

¹ Excludes inmates of institutions, members of the Armed Forces, Indians living on reservations, and residents of the Yukon and Northwest Territories.

Source: The Labour Force (Ottawa, Canada, Dominion Bureau of Statistics), various issues.

Source: Labor Developments Abroad, March-April, 1964, p. 23

Table P

CANADA, LABOR FORCE, BY INDUSTRY DIVISION AND SEX, MAY 1962

(In thousands)

Industry Division	Both sexes	Male	Female
Total population[1]	18,531	9,355	9,176
Labor force[1]	6,454	4,709	1,745
Agriculture, forestry, hunting and fishing	728	690	38
Mining and quarrying	84	81	3
Manufacturing	1,640	1,307	333
Construction	488	476	12
Electricity, gas, water, and sanitary services..	78	68	10
Commerce	1,260	833	427
Transportation, storage, and communication ..	468	407	61
Services	1,687	832	855
Persons seeking work for first time	21	15	6

[1] Excludes residents of the Yukon and Northwest Territories.

Source: *Year Book of Labour Statistics, 1963* (Geneva, International Labour Office), pp. 6 and 38.

Source: *Labor Developments Abroad, March-April, 1964,* p. 23

Table Q

CANADA, INDEXES OF NONAGRICULTURAL EMPLOYMENT,[1] BY INDUSTRY DIVISION, SELECTED YEARS, 1950-62

(1949 = 100)

Industry Division	1950	1953	1957	1960	September 1962[2]
All industry divisions	102.1	113.1	122.6	118.7	123.2
Forestry (chiefly logging)	104.8	98.3	99.3	84.0	74.0
Mining and quarrying	106.0	110.8	127.3	120.1	114.7
Manufacturing	101.4	113.0	115.8	109.5	116.6
Durable goods	101.7	123.5	123.3	112.6	122.3
Nondurable goods	101.1	103.9	107.6	106.8	111.9
Construction	103.1	116.1	135.7	125.7	123.1
Transportation, storage, and communication	100.2	111.2	120.4	111.1	109.2
Electricity, gas, water, and sanitary services	101.2	113.4	123.6	137.8	144.1
Trade, wholesale and retail	103.6	113.1	131.8	136.7	147.9
Finance, insurance, and real estate ..	105.9	122.4	145.0	156.7	161.1
Services	101.0	108.8	131.9	143.2	168.4

[1] Based on annual average of employment during last pay period of each month.

[2] Seasonally adjusted.

Source: *Employment and Pay Rolls* (Ottawa, Canada, Dominion Bureau of Statistics), September 1962, pp. 10-11.

Source: *Labor Developments Abroad, March-April, 1964,* p. 24

Table R

CANADA, RATE OF UNEMPLOYMENT,[1] BY OCCUPATIONAL GROUP, 1963 QUARTERLY AVERAGES

Occupational groups	1963 1st quarter	 2nd quarter	 3rd quarter	 4th quarter
All occupations:				
Unemployed persons (thousands)	545	371	271	305
Rate of unemployment[1]	8.4	5.5	3.9	4.5
Office and professional[2]	3.0	2.1	1.8	1.8
Transportation	12.7	7.9	4.5	6.3
Service	6.0	4.6	3.5	4.9
Primary industry workers[3]	10.3	5.9	2.8	4.4
Manufacturing and mechanical	4.6	4.3	3.6	3.8
Construction	22.5	11.5	5.7	9.4
Laborers, other[4]	28.3	17.1	9.3	13.5
Other unemployed[5]	(6)	(6)	(6)	(6)

[1] Unemployment as a percent of the labor force within each category.
[2] Includes managerial, professional, communication, commercial, financial, and clerical occupations.
[3] Covers agricultural, fishing, trapping, logging, and mining occupations.
[4] Includes laborers and unskilled workers not in agriculture, fishing, trapping, logging, or mining occupations.
[5] Persons who never had a full-time civilian job lasting 2 weeks or more.
[6] Not available.
Source: The Labour Force (Ottawa, Canada, Dominion Bureau of Statistics), December, 1963, pp. 2.
Source: Labor Developments Abroad, March-April, 1964, p. 24

Table 5

PROJECTED CHANGES IN CANADIAN LABOUR FORCE, BY AGE AND SEX, 1961 TO 1971

Age and Sex	Labor Force (thousands)		Percentage Change	Participation Rates[2]	
	1961	1971[1]	1961-71[1]	1961	1971[1]
Both Sexes					
14 to 19 years	634	798	25.9	36.5	32.4
20 to 24 years	821	1,228	49.6	69.2	68.6
25 to 44 years	2,960	3,422	15.6	63.1	68.1
45 to 64 years	1,882	2,583	37.2	60.7	64.3
65 years and over	221	281	27.1	17.1	16.5
Total	6,518	8,312	27.5	54.3	55.4
Male					
14 to 19 years	356	430	20.8	40.5	34.3
20 to 24 years	525	787	49.9	90.7	88.4
25 to 44 years	2,273	2,431	7.0	97.7	97.6
45 to 64 years	1,446	1,825	26.2	92.1	91.9
65 years and over	182	220	20.9	29.1	28.0
Total	4,782	5,693	19.1	80.8	76.8
Female					
14 to 19 years	278	368	32.4	33.4	30.3
20 to 24 years	296	441	49.0	48.8	49.0
25 to 44 years	687	991	44.3	29.1	39.1
45 to 64 years	436	758	73.9	28.5	37.4
65 years and over	39	61	56.4	5.8	6.7
Total	1,736	2,619	50.9	28.8	34.5

[1] Department of Labour forecast is based on assumption as 4% unemployment, 25,000 annual net immigration.

[2] Ratio of labor force to population.

Sources: Dominion Bureau of Statistics, Ottawa, Department of Labour, Ottawa.

Source: "The Employment Challenge in the 1960's—I"—Business Management Record, August, 1962, National Industrial Conference Board, p. 33